Attorney Docket : 821-55

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): Krogager et al.

Examiner: Daniels, Matthew J

Serial No.: 10/767,598

Group/Art No.: 1732

Filing Date: January 29, 2004

Dated: May 8, 2007

For: A REPAIR METHOD

Mail Stop: **Appeal Brief-Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

REAL PARTY IN INTEREST

The real party in interest of this application is SAAB, SE-58188, Linköping, Sweden.

RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge and belief, there are no currently pending related appeals, interferences or judicial proceedings.

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I hereby certify that this Appellants' Brief in triplicate is being deposited with the United States Postal Service as first class mail, postpaid in an envelope addressed to the: Mail Stop Appeal Brief-Patents, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 8, 2007

Dated: May 8, 2007

Leo G. Lenna

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Enclosed please find an APPELLANT'S BRIEF.

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Respectfully submitted,

Leo G. Lenna
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STATUS OF CLAIMS

This application was filed in the United States Patent and Trademark Office on January 29, 2004 with 19 claims and a preliminary amendment amending the claims to remove multiple dependencies and adding claim 20. Therefore, the application has 20 original claims of which Claim 1 was in independent form. In an amendment filed on May 16, 2006, in response to an Office Action mailed November 11, 2005, Claims 1 and 6 were amended to more precisely define the slots of the invention as "thin slots and fissures." The claims were also amended to eliminate formal objections and rejections and Claim 21 was added to the application in this amendment. In response to the final Office Action mailed August 8, 2006, a response after final along with a 37 C.F.R. 1.132 Declaration signed by one of the joint inventors was filed on December 8, 2006. No claim amendments were made in this response. Claims 1-21 remain as amended in the response to the Office Action filed on May 16, 2006. For the purposes of this Appeal, Claims 1-21 stand or fall together.

STATUS OF AMENDMENTS

In a 37 CFR 1.116 amendment filed December 8, 2006, in response to a final Office Action mailed August 8, 2006, no claims were amended. Thus, the Appendix to this Appeal Brief includes independent Claim 1 along with dependent Claims 2-21.

SUMMARY OF CLAIMED SUBJECT MATTER

As a result of extensive studies made by the inventors, it has been found that creating connection path by exposing the laminate at least in the region of the pore to forces making *thin slots or fissures* propagating substantially in the matrix through each laminate layer along the fibre direction of the layer allows the flowing, curable material at one outer surface of the laminate to travel more efficiently than through the coarse holes produced in the prior art. In other words, the thin slots or fissures facilitate

capillary action and allow the curable material to propagate through the laminate and fill the pore through the thin slots and/or fissures of the connection path.

In particular, the invention as recited in Claim 1 relates to a method for filling pores between two adjacent layers of a laminate for a component with high demands upon strength and comprising several layers of fibre composite having within each layer substantially parallel fibers embedded into a matrix, in which at least two adjacent layers have fibre directions differing substantially from each other. The steps recited in claim 1 comprise:

a) creating a connection path, through which a medium may move inside the laminate between the exterior of the laminate and the pore: b) applying a flowing, curable material at one outer surface of the laminate and filling the pore through said connection path: and c) curing the material filling the pore, wherein in step a), the connection path is created by exposing the laminate at least in the region of said pore to forces making thin slots or fissures propagating substantially in the matrix through each laminate layer along the fibre direction of the layer. (See page 3 lines 3-28). Claims 2-21 depend either directly or indirectly from Claim 1.

Support in the specification for dependent claims 2-21 can be found as follows:

Claim 1 (See page 3, lines 3-28);

Claim 2 (See page 3, lines 30-34);

Claim 3 (See page 4, lines 4-5);

Claim 4 (See page 4, lines 6-10);

Claim 5 (See page 4, lines 10-16);

Claim 6 (See page 4, lines 18-23);

Claim 7 (See page 4, lines 23-32);

Claim 8 (See page 4, lines 34-37);

Claim 9 (See page 5, lines 4-8);

Claim 10 (See page 5, lines 4-11);

Claim 11 (See page 5, lines 13-17);

Claim 12 (See page 6, lines 13-18);

Claim 13 (See page 7, lines 3-8);

Claim 14 (See page 7, lines 31-33);

Claim 15 (See page 6, lines18-19);

Claim 16 (See page 6, lines 23-26);

Claim 17 (See page 6, lines 23-26);

Claim 18 (See page 6, line 35- p. 7, line 2);

Claim 19 (See page 1, lines 13-23);

Claim 20 (See page 4, lines 6-10); and

Claim 21 (See page 4, lines 6-10).

GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed in this Appeal are the rejection of claims 1,8, 10, 11, 13, 15-19 under 35 U.S.C. § 103(a) as being unpatentable over Russell (Composite Repair Issues on CF-18 Aircraft, AGARD Conference Proceedings, Vol. 550, pages 14-1 to 14-8);

claims 2-5 and 20 under Russell (Composite Repair Issues on CF-18 Aircraft, AGARD Conference Proceedings, Vol. 550, pages 14-1 to 14-8) in view of Wilenski (Evaluation of an E-Beam Cured Material for Cryogenic Structure Usage 47th International SAMPLE symposium, 2002, pages 109-123);

claims 6,7,9 and 12 under 35 U.S.C. §103(a) over Russell in view of Kessler (Self-Activated healing of delamination damage in woven compositions, Composites: Part A, Vol. 32,2001, pages 683-699); and

claims 6,7,9 and 12 under 35 U.S.C. §103(a) over Russell in view of Rau (USPN 4,737,330).

THE LEGAL STANDARD

To reject claims in an application under 35 USC § 103, an Examiner must show an unrebutted *prima facie* case of obviousness. *See In re Deuel*, 34 USPQ2d 1210, 1214 (Fed. Cir. 1995). Obviousness must be based upon facts. *Ex parte Saceman*, 27 USPQ2d 1472, 1474 (BPAI 1993). When a conclusion of obviousness is not based on facts, it cannot stand. *Ex parte Porter*, 25 USPQ2d 1144, 1147 (BPAI 1992). Suggestion and motivation must be based on "actual evidence" that must be "clear and particular." *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the references." *In re Rijckaert*, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citing *In re Yates*, 211 USPQ 1149 (CCPA 1981)). "There must be some motivation, suggestion, or teaching of desirability of making the specific combination that was made by the applicant." *In re Lee,* 61 USPQ2d 1430 (Fed. Cir. 2002) (citing *In re Fine*, 837 F.2d 1071,1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1998)) "Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." *In re Kotzab*, 217 F. 3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). When considering a reference or combination of references, the art, as a whole must be considered for all of its

teachings. *In re Don Chemical*, 5USPQ2d 1529, 1531 (Fed. Cir. 1988); *In re Jezel,* 158 USPQ 98, 99-100 (CCPA 1968). The Examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art of that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fritch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). Any deficiencies in the references cannot be remedied by conclusory statements. *In re Zurko*, 59 USPQ2d 1693, 1697 (Fed Cir. 2001).

These findings have recently be supported in the recent Supreme Court decision, *KSR Int'l Co. v. Teleflex, Inc., Slip Opinion No 04-1350 (U.S. April 30, 2007).* In this decision, the Court noted the importance in identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. To facilitate review, this analysis should be made explicit. *(KSR, slip op. at 14)*. Therefore, in maintaining a rejection under 35 U.S.C. §103 (a) based on the combination of references, it remains necessary for there to be some suggestion and/or motivation why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.

When a claim of an application is rejected or objected to, any evidence submitted to traverse the rejection or objection on a basis not otherwise provided for must be by way of an oath or declaration under 37 CFR §1.132. Once a declaration under §1.132 has been submitted to overcome a rejection based on obviousness, it is the responsibility of the primary examiner to personally review the affidavit and decide whether the affidavit or declaration submitted is

responsive to the rejection(s) and for the examiner to present sufficient facts to overcome the rejection. (See 37 CFR 1.132 and MPEP § 716). In other words, a 1.132 affidavit *must be considered* by the examiner and cannot be dismissed without good and sufficient reasons why the affidavit does not overcome the rejection(s).

In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. *See In re Oetiker*, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness. *See id.*

ARGUMENT

(a). RUSSELL, THE PRIMARY REFERENCE IN THE FINAL REJECTION, DOES NOT TEACH OR SUGGEST A METHOD FOR FILLING PORES USING A CONNECTION PATH HAVING THIN SLOTS AND/OR FISSURES AND THEREFORE FAILS TO ESTABLISH A CASE OF *PRIMA FACIE* OBVIOUSNESS.

As enunciated in M.P.E.P. §2142, to establish a *prima facie* case of obviousness,

> (1) some suggestion or motivation to combine or modify the reference teachings must exist,
>
> (2) there must be a reasonable expectation of success, and
>
> (3) the references, in combination, must teach or suggest ***all*** the claim limitations.

In the Final Rejection mailed August 8, 2006, the Examiner maintained the position set forth in the previous rejection and asserted that "either the gas gun or the

drilling action which takes place during the repairing process of Russell would provide a force that would create slots or fissures." In support of this assertion, the Examiner again referred to Russell's Fig. 5 on page 14-3 and stated that this figure "shows the delamination produced by impact testing as horizontal lines in the laminate, and it is unclear how these [lines] cannot be interpreted to be thin slots or fissures." The Examiner also maintained that the interpretation of these defects as "thin slots or fissures" is valid based on the depiction in Fig. 5 of the defects as lines instead of as voids. As further support of this position, the Examiner relied on a newly cited reference Bhattacharyya (A Study of Drilling in Kevlar Composites, Composites Science and Technology, Vol. 58 (1998), pages 267-283).

The Applicants filed a response after final rejection along with a 1.132 Declaration providing a clear reason why the sections and Figure 5 of Russell do not teach or suggest thin slots and or fissures as required by the claims.

First, as acknowledged by the Examiner, Russell fails to explicitly teach that the lines in Figure 5 are in fact thin slots or fissures. (See final Office Action, page 3, last paragraph). Instead, as mentioned above, the Examiner asserted that it is clearly obvious that the lines in Fig. 5 of Russell represent thin slots or fissures as recited in the claims. The Applicants do not agree with this interpretation, but instead assert that the lines show "bores" which is consistent with the teachings of the rest of the article. In this regard, a Declaration under 37 C.F.R. § 1.132 executed by joint inventor Max Krogager in the capacity of an expert was submitted and provided specific reasons why the Russell document does not teach or suggest thin slots/fissures as claimed. In paragraphs 3-5 of the Declaration provided, Mr. Krogager described the distinct and

important improvement of producing thin slots and/or fissures instead of coarse drilling holes produced by drills and/or gas guns as in Russell.

In paragraphs 6-10 of the Declaration, Mr. Krogager stated that as an expert, Russell fails to teach or suggest the use of thin slots and/or fissures in the laminate and any of the accompanying advantages. Mr. Krogager stated that Figure 5 of Russell does not show thin slots or fissures, but instead the lines referred to by the Examiner in maintaining the rejections represent large fissures/slots of the boundaries between the layers in the structure. Mr. Krogager further stated that any other interpretation of these lines would indicate that the slots/fissures would have extensions all the way through the composite material. Based on this information, Mr. Krogager in the Declaration characterizes the lines in Figure 5 of Russell as "bores" and states that the use of bores by Russell involves searching and striking the end portions of fissures/slots corresponding to the lines depicted in Figure 5 of Russell so as to make the bores even larger in order to repair the laminate.

Therefore, Russell explicitly teaches a method for repairing laminate structures on CF-18 aircrafts using large bores to repair cracks in the lamination as illustrated in Figure 5 and not thin slots and/or fissures as in the present invention. In fact, Mr. Krogager contends that as an expert in the field, one skilled in the art after reading the Russell disclosure would be led away from producing thin slots and/or fissures as in the present invention, but would instead be driven to use coarse holes such as bores to repair laminate structures of CF-18 aircrafts.

In a Advisory Action mailed January 8, 2007 in response to the amendment after final rejection submitted with a 1.132 Declaration, the Examiner stated that the

"declaration has not been considered" and that "Russell clearly creates the connection paths (page 14-2) either by impact testing, drilling, or drilling followed by loading (page 14-3, right column, bottom)." (*see* Advisory Action, page 2).

However, for the reasons stated above and in the Declaration submitted with the 1.116 amendment, figure 5 and the sections in Russell relied on by the Examiner do not in fact show that Russell creates connection paths by exposing the laminate, at least in the region of the pore, to forces making *thin slots or fissures* propagating substantially in the matrix through each laminate layer along the fibre direction of the layer as claimed in claim 1 of the present invention.

Moreover, even assuming, *arguendo*, a *prima facie* case of obviousness of the claimed invention over the cited art has been made by the Examiner, nevertheless the Declaration under 37 C.F.R. §1.132 from joint inventor Mr. Krogager clearly rebuts any such presumption for the reasons discussed above and therein. In view of this, the rejections of claims 1-21 under 35 U.S.C. §103 should be reconsidered and reversed.

(B). BHATTACHARYYA FAILS TO SUPPORT THE EXAMINER'S INTERPRETATION OF RUSSELL AND THEREFORE FAILS TO ESTABLISH A CASE OF *PRIMA FACIE* OBVIOUSNESS.

In the Final Rejection mailed August 8, 2006, the Examiner relied on Bhattacharyya (A Study of Drilling in Kevlar Composites, Composites Science and Technology, Vol. 58 (1998), pages 267-283) to support his incorrect interpretation of Russell. However, as stated in the amendment after final, a close reading of Bhattacharyya actually indicates that Bhattacharyya does not support the Examiner's interpretation of Russell but instead supports the Applicants' interpretation that Figure 5

of Russell *does not teach* thin slots and/or fissures.

Firstly, Bhattacharyya clearly uses a different drilling mechanism with specialized drill bits than the coarse drilling recited in Russell and therefore cannot be compared with the holes made in Russell. In Russell, the "holes were drilled with a small portable drill mounted to a stand fitted with a micrometer feed", (See Russell, page 14-5, column 1, lines 26-30), where as the holes produced in Bhattacharyya were "drilled with modified drill bits under cryogenic conditions without any backing plate were, as expected, more susceptible to delamination". (See Bhattacharyya, page 277, column 1, lines 12 - 15.) In addition, the holes made in Russell were made using a coarse drill attached to an extension containing regular drill bits and the laminated structure was supported by a backing plate.

In fact, the drilling mechanism described in Russell for making the holes shown in Fig. 5 of Russell are reported in Bhattacharyya as causing little or no delamination of the laminated structure. Bhattacharyya clearly states that it "was very evident that the specimens machined with normal drills using a backing plate (as in Russell) showed little or no delamination under both ambient and cryogenic conditions. (See Bhattacharyya, page 277, column 1, line 16 to column 2, line 1.) Therefore, the Applicants respectfully contend that Bhattacharyya does not support the Examiner's interpretation of Russell, but instead actually supports the Applicants' contention that Russell, Fig. 5 does not show thin slots or fissures as recited in the present claims and does not cause delamination as in the present invention. Thus, the Examiner's reliance on Bhattacharyya in support of his interpretation of Russell is misplaced.

Moreover, in addition to the specific portion of the art relied on by the Examiner

in making the rejection, the art, as a *whole must* be considered for all of its teachings. *In re Don Chemical*, 5USPQ2d 1529, 1531 (Fed. Cir. 1988); *In re Jezel,* 158 USPQ 98, 99-100 (CCPA 1968). Therefore, even were the Examiner to use the teachings of Bhattacharyya to support his interpretation of Russell, Bhattacharyya must be considered in its entirety. In doing so one would be driven to conclude that the type of drilling as well as the drilling mechanism described in Russell for making the holes shown in Fig. 5 of Russell is reported in Bhattacharyya as causing little or no delamination of the laminated structure. Bhattacharyya clearly states that it "was very evident that the specimens machined with normal drills using a backing plate (as in Russell) showed little or no delamination under both ambient and cryogenic conditions. (See Bhattacharyya, page 277, column 1, line 16 to column 2, line 1.) Therefore, the Applicants respectfully contend that Bhattacharyya does not support the Examiner's interpretation of Russell, but instead actually supports the Applicants' contention that Russell, Fig. 5 does *not* show thin slots or fissures as recited in the present claims and does not cause delamination as in the present invention. In addition, using the drilling methods discussed in Russell and supported by Bhattacharyya would actually cause one skilled in the art to be unequivocally led away from practicing the claimed invention. Thus, for this additional reason, the Examiner's reliance on Bhattacharyya in support of his interpretation of Russell is misplaced and the rejection of the claims should be reconsidered and reversed.

(C.) RUSSEL DOES NOT PROVIDE THE REQUISITE MOTIVATION TO USE THIN SLOTS AND/OR FISSURES AS RECITED IN THECLAIMS OF THE PRESENT INVENTION.

It is well settled in order to establish a *prima facie* case of obviousness, it is *necessary* for the Examiner to present evidence preferably in the form of some teaching, suggestion, incentive or inference in the applied prior art that one having ordinary skill in the art *"would have been led"* to do what the Applicants have done. *See Ex parte Levengood*, 28 USPQ2d 1300, 1301 (BPAI 1993), and *Ex parte Chicago Rawhide Mfg.* Co., 223 USPQ 351, 353-54 (Bd. App. 1984). The kind of suggestion which would have *"strongly motivated"* one skilled in the art to use a method for filling pores (2) between two adjacent layers (1', 1") of a laminate for a component with high demands upon strength using *thin slots or fissures* as claimed. *Ex parte Graselli*, 231 USPQ 393,394 (Bd. APP. 1983). That is, a kind of suggestion that would have suggested a method that specifically creates a connection path by exposing the laminate at least in the region of the pore to forces making *thin slots or fissures* propagating substantially in the matrix through each laminate layer along the fibre direction of the layer "thin slots." That, too, is what a conclusion of obviousness requires. See *Levengood*, supra.

In fact, neither Russell nor Bhattacharyya state that there is any problem with using large bores to fill the holes in a laminate of an aircraft. The requirement for providing the suggestion and/or motivation to combine the prior art documents so as to do what the Applicants have done in order to support a finding of obviousness was

recently reinforced in the Supreme Court decision, *KSR Int'l Co. v. Teleflex, Inc., Slip Opinion No 04-1350 (U.S. April 30, 2007)*. In this case, the Court noted the importance in identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. To facilitate review, this analysis should be made explicit. *(KSR, slip op. at 14)*.

Here, the Examiner alleges that holes made into a laminated structure, even though produced by a method that is know to cause coarse holes, namely bores, are equivalent to the *thin slots or fissures* that are necessary to propagate substantially in the matrix through each laminate layer along the fibre direction of the layer "thin slots " of the claimed invention. The use of thin slots or fissures is essential for the claimed method. However, for the reasons stated above the prior art has been misinterpreted but even if the reading of the prior art documents were correct, the Examiner has failed to provide a reason that would *have "prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed."* (See KSR v. Teleflex, supra).

In fact, the Examiner reference to Figure 5 and the text in Russell and Bhattacharyya is done devoid from the rest of the teaching of these prior art references. That is, the fact that the Examiner does not address that fact that both Russell and Bhattacharyya contain language that either teaches away from using thin slots and/or fissure or uses methods that are known *not* to create thin slots and/or fissures but instead to create bores is evidence that the Examiner has picked and chosen selective information to support the rejection. Accordingly, what the rejection actually boils down to is one *"could have"* or *"would have been able to"* do what the Applicants have done. That, however, is not the standard under 35 USC §103, and has long been rejected as a substitute for the

elements required of an Examiner to meet his burden of establishing a prima facie case of obviousness (*Ex parte*, supra at 1301; and *Ex parte Markowitz*, 143 USPQ 303, 305 (Bd. App. 1964).

In addition, it is fundamental that it is impermissible within the framework of §103 to *pick up and choose from any one reference only so much of it as will support a given position*, to the exclusion of other parts necessary to achieve full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 USPO 391,393 (CCPA 1965). In addition, as is fundamental, "[a] prior art reference must be considered in its entirety, *i.e.*, as a whole, *including portions that would lead away from the claimed invention.*" (Underline original, bold emphasis added). *See* MPEP § 2141.02 at 2100-95. A primary reference, such as Russell, that when read in its entirety actually "teaches away" from the claimed invention in view of Bhattacharyya, Wilenski and/or Kessler and/or Rau, is sufficient to show that one would *not* have combined the references. *See* MPEP § 2145 at 2100-123 ("It is improper to combine references where the references teach away from their combination."). Here, as stated above, Russell explicitly teaches penetration damage to panels created using high-speed gun gas facility that are known to cause large bores *not* thin slots and/or fissures. And that is what one of ordinary skill in the art would have taken away from Russell in view of Bhattacharyya, Wilenski and/or Kessler and/or Rau. And that, is the opposite of what is claimed. Therefore, it is not suggestive of what is claimed.

Accordingly, it is respectfully submitted that the Examiner has not meet his burden of establishing a *prima facie* case of the cited art and the Appellants respectfully request that the rejections be reconsidered and reversed.

CONCLUSION

For all of the foregoing reasons, it respectfully is submitted that the Examiner has failed to make out a *prima facie* case of obviousness and hence the rejection of claims 1 – 21 under 35 USC § 103 should be reconsidered and reversed.

Dated: May 8, 2007

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CLAIMS APPENDIX

1. A method for filling pores (2) between two adjacent layers (1', 1") of a laminate for a component with high demands upon strength and comprising several layers of fibre composite having within each layer substantially parallel fibers (5) embedded into a matrix (6), in which at least said two adjacent layers have fibre directions differing substantially, which comprises the steps of:

a) creating a connection path, through which a medium may move inside the laminate between the exterior of the laminate and the pore,

b) applying a flowing, curable material at one outer surface of the laminate and filling the pore through said connection path, and

c) curing the material filling the pore, wherein in step a), said connection path is created by exposing the laminate at least in the region of said pore to forces making thin slots or fissures (4) propagating substantially in the matrix through each laminate layer along the fibre direction of the layer.

2. A method according to claim 1, comprising in step a), the additional step of cooling said laminate at least in the region (3) of said pore (2) to a sufficiently low temperature such that the matrix material contracts between said fibres to thereby create said thin slots or fissures (4) along the fibres.

3. A method according to claim 2, wherein in step a), the cooling is carried out to a temperature below -70°C.

4. A method according to claim 2, wherein in step a), said laminate is cooled by applying liquid nitrogen or carbon dioxide snow on the laminate.

5. A method according to claim 2, comprising the additional steps of:

restricting a region (3) of the outer surface of the laminate right in front of said pore (2), and in step a), applying cooling medium on the laminate only within the restricted region.

6. A method according to claim 1, wherein in step a), said connection path is created by exposing the laminate to outer forces in planes transverse to the fibre direction of the layers of the laminate, such that the thin slots or fissures (4) propagate through each layer along the fibre direction of the layer.

7. A method according to claim 6, wherein the forces applied in step a) are maintained during step b) to act to open the thin slots or fissures (4) and facilitate transport of the flowing material to the pore (2), and after the filling in step b), said forces are removed before the curing step c) for automatically pressing superfluous flowing material out of the slots.

8. A method according to claim 1, comprising the additional step of:

directly before and/or in connection with step b),heating the laminate at least in the region of said pore (2) to a temperature necessary for making said flowing material

thinly fluid.

9. A method according to claim 1, wherein in step b), outer forces are applied on the laminate in planes transverse to the fibre directions of the different layers to open said thin slots or fissures (4) when applying the flowing material on the outer surface of the laminate for facilitating the transport of the flowing material to said pore (2).

10. The method according to claim 1, comprising the additional step of, in step b), applying a negative air pressure surface of the laminate on which the flowing material is applied, to facilitate the transport of the flowing material into the laminate through the thin slots or fissures (4).

11. The method according to claim 1, comprising the additional step of providing a laminate with layers of carbon fibre epoxy.

12. The method according to claim 1, comprising the additional step of providing a laminate with layers of glass fibre polyester.

13. The method according to claim 1, wherein in step b), an epoxy glue is applied as said flowing, curable material.

14. The method according to claim 8, wherein said heating is carried out to a temperature exceeding +40°C.

15. The method according to claim 1, comprising the additional step of providing a laminate in which fibre direction of a respective layer makes an angle of 30 - 90 ° with fibre direction of adjacent layers.

16. The method according to claim 1, comprising the additional step of providing a laminate having a thickness of each individual layer between 0.05 and 0.2 mm.

17. The method according to claim 1, comprising the additional step of providing a laminate composed of 4 -200 superimposed layers.

18. The method according to claim 1, comprising the additional step of filling, in step b), pores having an area of at least 36 mm^2.

19. The method according to claim 1, wherein one or more pores are filled for a component for a flying vehicle or a spacecraft.

20. A method according to claim 3, wherein in step a), said laminate ~~it~~ is cooled by applying liquid nitrogen or carbon dioxide snow on the laminate.

21. A method according to claim 3, wherein the cooling is carried out to a temperature below -150°C.

EVIDENCE APPENDIX

A Declaration pursuant to 37 C.F.R §1.132 that was submitted by the Appellants in the 37 C.F.R. §1.116 amendment filed December 8, 2006 and entered by the Examiner is herein relied upon by Appellants.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 C.F.R. 41.37.

Attorney Docket No.: 821-55

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Max Krogager.	Group Art Unit: 1732
Serial No:	10/767,598	Examiner: Daniels, Matthew J.
Filed:	January 29, 2004	
For:	**A REPAIR METHOD**	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION

I, Max Krogager, do hereby declare:

1. I am one of the joint inventors of the invention being claimed in the above-identified patent application;

2. I have read and understand the Office Action mailed August 8, 2006 by the Patent and Trademark Office in the above-identified application and the art being applied therein, namely, Russelll (Composite Repair Issues on the CF-18 Aircraft, AGARD Conference Proceedings, Vol. 550, pages 14-1 to 14-8) (herein referred to as "Russelll").

3. The present invention provides distinct and important improvement in a repair method for components consisting of laminates of composite material with high demands upon strength. The method comprises producing connection

paths in the form of thin slots or fissures making the laminate permeable to gas and/or liquid, so that a connection path between the exterior of the laminate and a pore is achieved. The thin slots or fissures produced by the claimed method are used instead of the considerably coarser drilling holes of Russelll, the thin slots or fissures resulting in flowing materials being drawn into the laminate through capillary effects.

4. One explicit advantage of my invention is reaching pores within the laminate structure without having coarse or large holes in the laminate.

5. The micro slots created by the method of the present invention create cracks filled up by flowing material over the entire area of the laminate, penetrating every delamination in the structure.

6. Russelll fails to teach or suggest to me, one skilled in the art, the use of thin slots or fissures in the laminate and accompanying advantages, for the following reasons;

7. In particular, Figure 5 of Russelll shows a schematic drawing of a laminate structure which does not illustrate any micro slots, thin slots or fissures. Instead, the lines in Figure 5 represent large fissures/slots of the boundaries between the layers in the structure, since otherwise the slots would have extensions all the way through the composite material. (Which is not shown in Figure 5)

8. Contrary to the assertions made in the Office Action mailed August 8, 2006, Russelll does not disclose thin slots/fissures but instead Figure 5 shows bores. The use of bores by Russelll involves searching and striking the end portions of fissures/slots corresponding to the lines in Figure 5 of Russelll.

9. In stark contrast to Russelll, the use of micro slots according to the present invention advantageously allows the flowing material itself to seek out the

delaminations over the entire area and not just near the area the bores as in Russelll.

10. Therefore, Russelll explicitly teaches a method for repairing laminate structures on CF-18 aircrafts using large bores to repair cracks in the lamination as illustrated in Figure 5 instead of thin slots/fissures as in the present invention. Hence, Russelll would lead me, one skilled in the art, away from practicing my invention.

11. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further these statements are made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and such willful false statement may jeopardize the validity of the application or any patent issued thereon.

2006-12-06

Date

Max Krogager